

FLIGHT

The
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ENGINEER
&
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

Sept. 23....	Gordon Bennett Balloon Race, Belgium
Sept. 28....	Schneider Cup Seaplane Race at Cowes
Oct. 4	R.Ae.S. Inaugural Lecture
Oct. 8-13	Light 'Plane and Glider Competitions, Lympne
Oct. 12	"Some Aspects of an Attempt to Fly Round the World," by Maj. W. T. Blake, before I.Ae.E.
Oct. 14	Beaumont Cup Race at Istres, France
Oct. 18	"The Manœuvres of Inverted Flight," by Sq.-Leader R. M. Hill, before R.Ae.S.
Oct 26	"Three-Ply in Aircraft Construction," by Capt. R. N. Liptrot, B.A., before I.Ae.E.
Nov. 1	"Present Developments in Aircraft Instruments," by Major Wimperis, before R.Ae.S.
Nov. 9	"Soaring Flight," by Dr. E. H. Hankin, before I.Ae.E.
Nov. 15	"The Thermodynamics of Aircraft Engines," by Mr. H. R. Ricardo, before R.Ae.S.
Nov. 29	"Airmanship at Sea," by Sqd.-Ldr. Maycock
Nov. 30	"The Result of Twelve Years' Welded Tube Construction and the Development of Cantilever Wings," by A. H. G. Fokker, before, I.Ae.E.
Dec. 1	Entries close for French Aero Engine Competition

EDITORIAL COMMENT.



ON Thursday of next week, September 27, the navigability and watertightness tests in connection with the International seaplane race for the Schneider Cup will be carried out off Cowes, Isle of Wight. A change has been made in this year's regulations in so far as the navigability tests precede the mooring and watertightness tests. Thus, if a machine springs a leak in its hull or floats during the taxi-ing or alighting, and the leak is of any consequence, the machine will not be able to spend the required six hours at its buoy without foundering. If it is removed from the buoy the machine forfeits its right to fly in the Friday's race. It may be thought that this is a somewhat stiff test to impose, but, on the other hand, if one is to combine speed with a fair amount of seaworthiness, thus avoiding that the Schneider Cup International Races degenerate into producing nothing but racing freaks, incapable of weathering even a very moderate sea, some such precaution seems to be necessary, and we think the Racing Committee of the Royal Aero Club has done quite right in stipulating that the mooring test shall be carried out *after* the machines have done their taxi-ing, etc. And, after all, the conditions are the same for all competitors, so that the new regulation does not handicap one type more than another.

Just as we go to press this week it is learned that the Italians have withdrawn from the race. This is very much to be regretted, as the Savoias and Macchis have always been well to the fore in the Schneider Races, and will be greatly missed at Cowes next week. No reason for the withdrawal is given, but it may be assumed that the present conditions in Italy are not such as to favour the expenditure of large sums of money on seaplane racing. While the Schneider Races were held in Italy—as a result of Janello's plucky performance at Bournemouth in 1919—the expenditure was confined to the construction of machines. This year, thanks to Capt. Biard's magnificent performance on the Supermarine "Sea Lion" at Naples last year, the race has been transferred to this country, and the expense to Italian

competitors of sending machines and pilots to England would consequently be very much increased. Whatever the reason for the non-participation by Italy, the absence of Italian machines will be regretted by all who have the sport at heart. We can sympathise with them all the more when we remember that if the American competitors carry off the cup this year it is very doubtful if it will ever be brought back to England. The expense of sending machines to America would be so great as to be beyond the financial capacity of any private aircraft firm, and it does not appear likely that the Air Ministry would be willing to finance our representatives in the manner the American Government has done.

As regards the chances of the British team, which has been reduced to two by the unfortunate mishap to the Sopwith-Hawker racer, much will depend upon the weather. The American machines are all three of the twin-float type, and if the sea is very smooth so as to enable them to carry out successfully the navigability and watertightness tests they will certainly prove formidable opponents in the matter of speed. The Curtiss-Navy Racer, with 400 h.p. Curtiss engine, two of which have been entered, is credited with a speed of 175 m.p.h., while the Navy-Wright, with 700 h.p. engine, is stated to have attained an average speed over a measured course of 177.5 m.p.h.

The three French representatives are one C.A.M.S., with 360 h.p. Hispano-Suiza, to be piloted by Hurel; one Blanchard, with 400 h.p. French-built Bristol "Jupiter," to be piloted by Teste; and one Latham twin-engined machine, with two 400 h.p. Lorraine-Dietrich engines, to be piloted by Duhamel. All three are of the flying boat type.

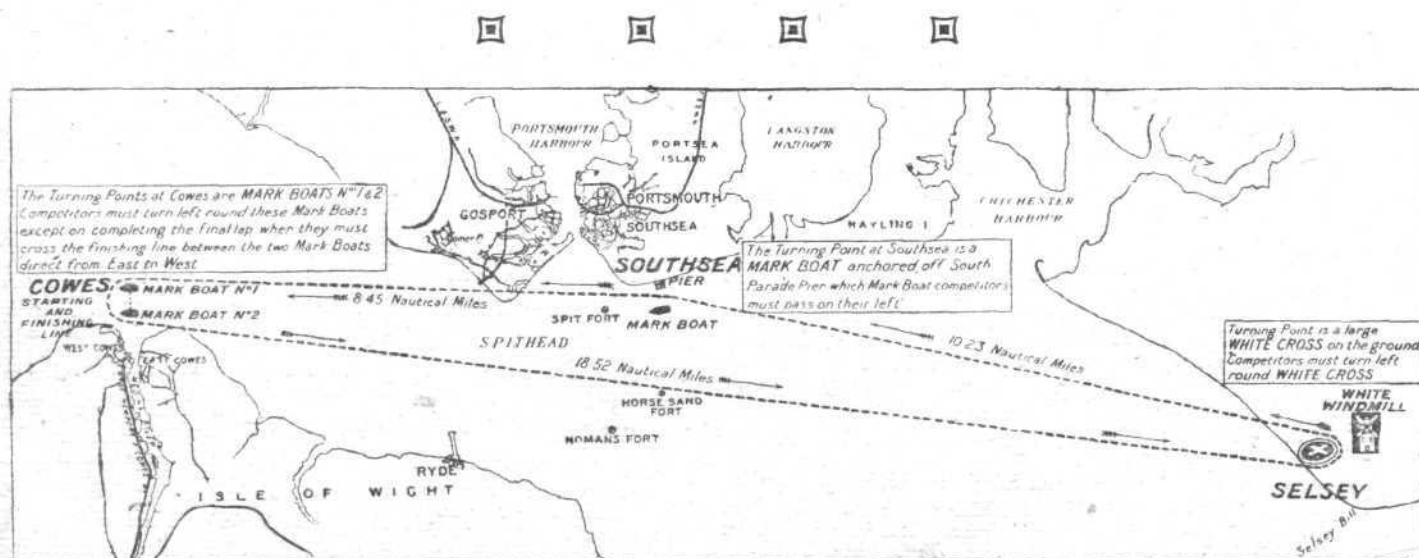
As the two British representatives, the Supermarine "Sea Lion," with Napier "Lion" engine, and the Blackburn "Pellet," also with Napier "Lion," are flying boats, this type of seaplane will predominate, and it will be interesting to see how this type compares for speed with the twin-float seaplane, as represented by the American C.R.-3's and N.W.-2. If the sea is at all rough it seems probable that the flying boats will be slightly better off than the seaplanes, but in pure speed the twin-float type might score. Thus it is regrettable that the Sopwith-Hawker machine was crashed, as it would have given us one representative

of the twin-float type to match against the American team.

There can be no doubt that the race will be a very keen one, and as the course has been so laid as to bring the competing machines quite close to Southsea pier, while the two mark boats are just off Cowes, there should be a good opportunity to witness the race from either Southsea or Cowes. Which of the two places is chosen is mainly a matter of convenience and personal preferences. Southsea is perhaps slightly easier to reach from London, and has the advantage of being at a point in the course where no sharp change of direction occurs. Consequently the machines will be travelling at maximum speed past Southsea pier. At Cowes, on the other hand, is the starting and finishing line, and visitors will be able to see the machines on the sea. Around the two mark boats off Cowes the competitors will have almost to double back on their tracks, turning through an angle of close upon 180°, so that, although they will not be going "all-out," they will be obliged to make some very steeply banked turns, and will thus afford the spectators an excellent opportunity of watching the "cornering" of the various pilots.

Under the Royal Aero Club Notices on p. 566 will be found detail information relating to hotel accommodation, R.Ae.C. Headquarters, etc., which we would recommend our readers to study carefully, as the information is of general interest to other than members of the Club.

The total length of the course is 37.2 sea miles, or 42.86 land miles. Assuming 155 m.p.h. as an average speed around the course one lap should be covered in 16½ minutes. Some competitors will probably take a little longer, and some will do it in less time. As the interval between the starts of the representatives of two countries has been fixed at 15 minutes, it seems likely that one batch may be despatched just as the previously-started team is rounding the mark boats at Cowes, and thus there may in time be quite a crowd of machines at any turning point. It will certainly not be easy for visitors to follow the race in detail, and probably a certain amount of confusion will be unavoidable. The course has to be covered five times, so that the race should be over in something like two hours.



THE SCHNEIDER INTERNATIONAL SEAPLANE RACE: Plan of the course. Competitors must cover the course in the direction indicated by the arrows, and must pass the turning points on their left at a height of not more than 500 ft. In the laps the two mark boats at Cowes must both be rounded, but at the finish machines must cross the line between the two boats.

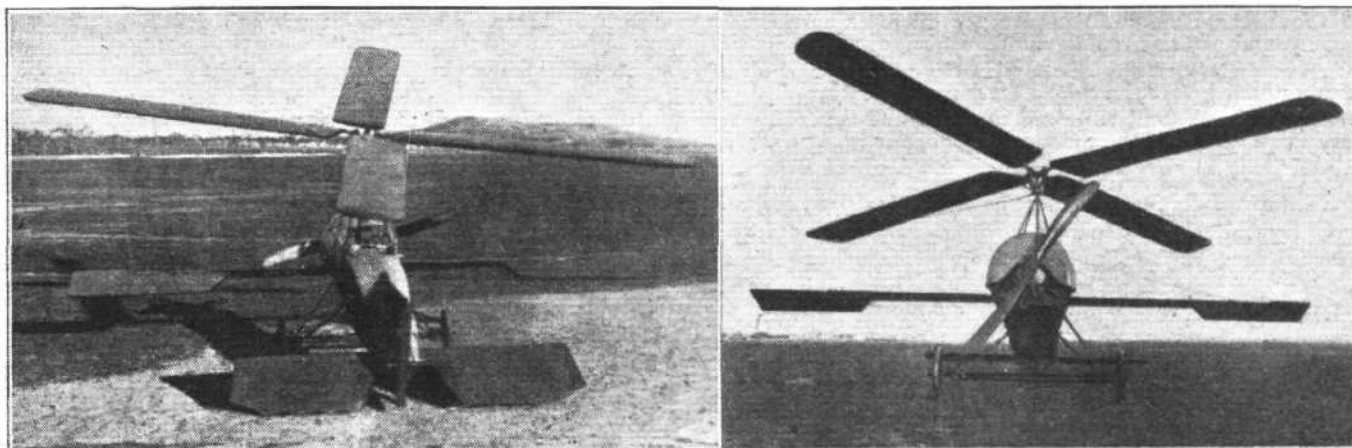
MORE ABOUT LA CIERVA "AUTOGIRO"

IN our issue for May 24 last we illustrated and made brief reference to an interesting and original Spanish machine known as the Cierva "Autogiro." We had not at the time any details bearing on the operation of this machine, and our only information was to the effect that trial flights had successfully been accomplished at Cuatro Vientos aerodrome, near Madrid. In a recent issue of our American contemporary there appeared some further particulars on the matter, which we quote herewith.

The "Autogiro" is not, strictly speaking, a helicopter, but is in fact based on principles entirely different from those followed in the construction of helicopters—and aeroplanes too, for that matter. A helicopter is sustained in flight by a lifting screw which an engine causes to rotate in a horizontal

The rest of the machine is an ordinary tractor aeroplane (without the wings), with an 80 h.p. Le Rhone engine driving a tractor airscrew, and the usual tail surfaces. The experimental model was fitted with two aileron extensions, on either side of the fuselage, in order to safeguard the pilot against unexpected occurrences, but the experiments proved that this precaution was unnecessary, for the machine did not require lateral means of control. The "Autogiro" was found to take automatically its correct bank on turns, for the hinged connection of the blades of the vane—referred to later—keeps the plane of rotation always at right angles with the bearing shaft, and this despite the gyroscopic effect.

It is well known that when a stationary airscrew is exposed to an air current, the blades being in position A, shown in the



Rear and front views of La Cierva "Autogiro."

plane, and it lifts vertically. In the "Autogiro," on the contrary, the big four-bladed screw, which is mounted on a vertical shaft fixed on the fuselage, is not actuated by any power plant, but instead is made to turn freely on its bearings. Consequently this "screw" is actually a wind vane which actuates like the small propellers of fuel pumps, *i.e.*, it is the relative wind created by the forward motion of the machine which causes it to rotate.

On the "Autogiro" the big wind vane is mounted in ball bearings and is not controlled in any manner by the pilot.

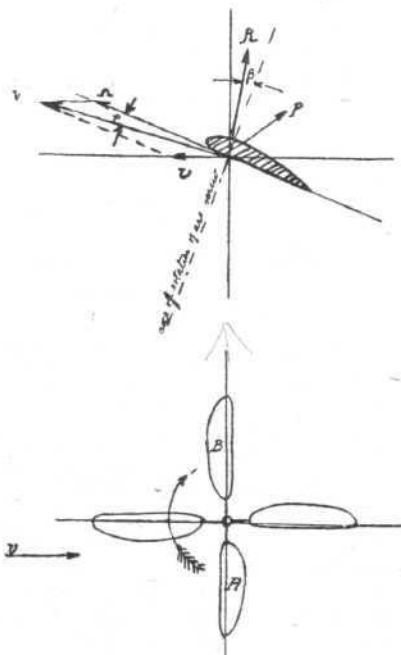


Diagram showing the forces in the lifting vanes.

The blades of the vane are set at a fixed angle of incidence relative to the axis of rotation, but they are hinged to the bearing shaft in such a way that in flight they place themselves in the resultant of their lift and centrifugal force.

accompanying diagram, have a resultant R which makes an angle with the airscrew shaft. The resultant P of the opposite blade (position B) has always a smaller angle than A or is negative. Therefore a rotation is established by the airscrew as indicated by the arrow. The speed of rotation will increase until the resultant of R and P is parallel to the axis of rotation of the airscrew. The whole lifting body does not transmit to its shaft any torque except the one produced by the friction of the bearings, which can be neglected, eliminating therefore the necessity of using two propellers.

However, the resultant velocity of the blades relative to the air in position A is greater than in B, and its lift will be greater also. Therefore, the total resultant of this airscrew will not pass through its centre, and the whole system will tend to bank. This banking effect has been overcome by fixing the blades to the shaft by means of a hinge, which permits them to set themselves automatically in the resultant position of the centrifugal force and lift. Thus the blades A will bank slightly, while blades B will remain horizontal, and the total resultant of the lifting airscrew will always pass through its centre.

If we analyse the effect of the hinged blades of the vane, we see that the shaft can freely change its angle with the plane of rotation of the blades, but that the blades have a strong tendency to return to their original position relative to the shaft. This gives an automatically perfect banking in the turns and stability in flying.

The velocity of the blades relative to the air is much greater than the translational speed of the whole machine. The angle of attack is a function of the translational speed of the machine and the angle between its direction of motion and the plane of rotation of the blades. This allows a much greater range of speeds and angles of flying to the whole machine, and will permit landings in very small spaces without horizontal motion.

The "Autogiro" weighs about 880 lbs. empty and 1,100 lbs. loaded. The horizontal speed attained is from 38 to 55 m.p.h. The rotational speed of the lifting vane is about 140 r.p.m. in horizontal flight. The descending speed in vertical landings is of about 6-10 ft. per sec.

It may be of interest to note that the inventor of this machine, Juanito Cierva, is the son of one of the most popular Spanish political figures who has been several times Minister of War, Minister of the Interior, and Minister of Finances, and is at the present time the chief of a Spanish political group.

LIGHT 'PLANE AND GLIDER NOTES

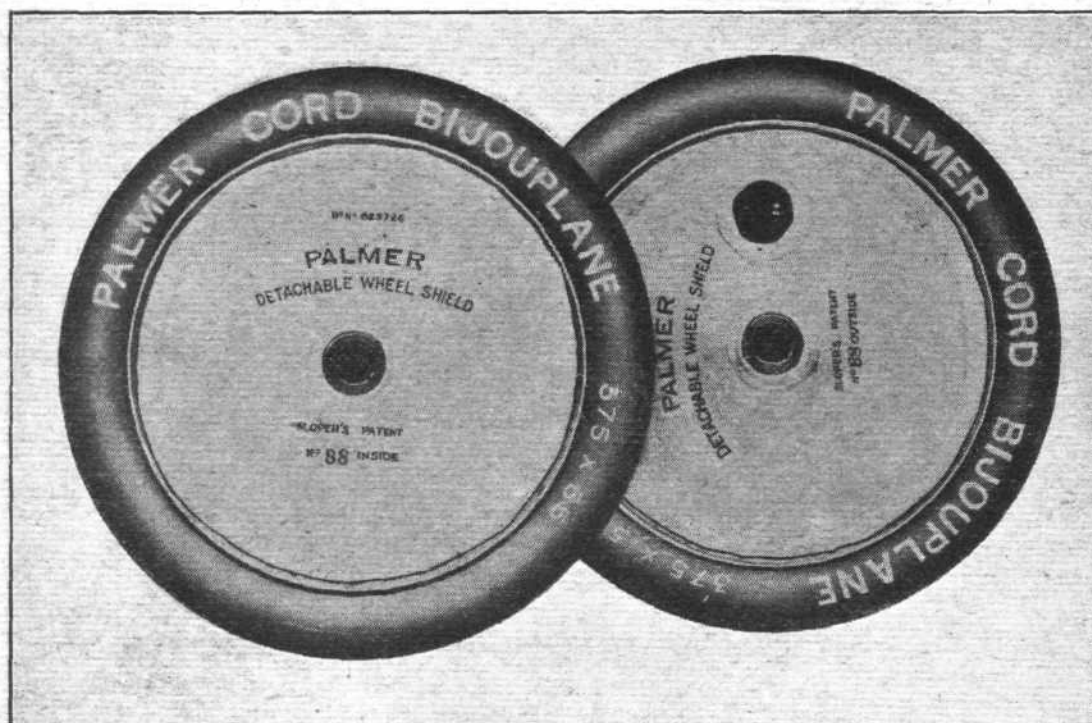
MANY of the machines entered for the Lympne competitions are now finished, and their flying tests have begun, with the consequence that interest in the light 'plane movement is seeing a revival, which should be of material assistance in the months to come. Last week we had the good fortune to witness two trial flights at Brooklands of the Vickers light 'plane—the "Viget," as she is called. On our arrival at the Vickers' works the machine had just been completed, and the "Viget" was standing on the track opposite the works, having her Douglas engine tested. Although it appeared that further engine adjustments might be necessary Capt. Cockerell decided to make a trial flight, and the machine was consequently towed along the track and on to the aerodrome. Capt. Cockerell got into his seat, the engine was started very easily, thanks to the reduction gearing of $2\frac{1}{2}$ to 1, which gears up the engine on starting and gives a good sharp pull. Just as Cockerell began to trickle along the ground it was noticed that what little wind there was was a following wind. In spite of this fact, however, the machine got off after a relatively short run, and commenced to climb.

It was noticed that the "Viget" seemed very sensitive on the ailerons, as was to be expected from the fact that these are of very large area and the machine of short span. However,

reasonably expect in a type built for cheap production in fairly large quantities.

LAST week we published a photograph of Raynham's Handasyde light 'plane, and this week we give a detailed illustrated description of this machine. During last week Raynham had the 'bus out for a flight, and she seemed quite O.K. The Handasyde monoplane, like the Vickers "Viget," is fitted with a 750 c.c. Douglas engine, and in both machines this engine has been found to run remarkably smoothly, giving practically no vibration. In Raynham's monoplane direct drive is used, whereas in the Vickers' there is a chain reduction gearing of $2\frac{1}{2}$ to 1.

As previously mentioned in FLIGHT, the de Havilland Aircraft Company are building two light 'planes at their Stag Lane works. Both are built to the same drawings, and are fitted with Douglas engines of 750 c.c. They are monoplanes with the wing placed low on the fuselage and braced by struts to the top of the fuselage. The wing is in two halves, hinged to the lower longerons, the greatest spar depth occurring at the point where the struts are attached. The workmanship is excellent, as one would expect from a firm of this standing, and the machines are of straightforward design, with no experi-



A new Palmer wheel: As a demand has arisen for an aero wheel suitable for light 'planes Messrs. Palmer Tyre, Ltd., have produced the Palmer Cord Bijouplane wheel, measuring 375 by 55 mm. and weighing 5 lbs.

after reaching the Paddock Cockerell made a left-hand turn and came back towards the Byfleet side. Coming in over the track he made a perfect three-point landing, and later informed us that the machine was quite O.K., but that the engine was down on revs. After certain alterations, a change of jet, etc., Cockerell had the machine out again during the afternoon, and made a flight of about 15 minutes' duration, again landing perfectly.

THE way in which the "Viget" handles is a revelation, and especially are the turns remarkable, the machine actually appearing to turn in her own length. As Cockerell expressed it, she seemed to spin around with practically no forward speed. When one comes to think the matter over, this should, of course, be so, the machine being very manœuvrable and not very fast, so that in a given time she can change her direction to a vast extent. Incidentally, this should be much in the favour of the light 'plane, as it may even be possible for a pilot to turn back over the aerodrome should his engine fail as he is taking off.

A full illustrated description of the Vickers "Viget" appears in this week's issue of FLIGHT, from which the main points of the design should emerge. The workmanship and finish of the machine are remarkably fine, and it is of interest to note in this connection that in spite of this fact the cost has not been by any means prohibitive. It would scarcely be fair to quote actual figures, but although the machine is finished up to aero show standard, the cost is no higher than one would

mental features other than the low wing position, which can scarcely be called experimental as it has been used extensively in Germany. The view from the pilot's cockpit should be excellent.

THE de Havilland light 'planes are fitted with a low V undercarriage, but in view of the low wing position and the fitting of wing-tip skids, it should be next to impossible for them to blow over when on the ground, a risk always present in lightly-loaded machines in which the wing tips are a considerable distance above the ground.

DESIGNERS of low-power aeroplanes have found recently that, generally speaking, the smallest size Palmer wheels made are a shade too small, while the next size is for most machines a little too large. With that prompt realisation of and attention to possible new developments that has been instrumental in placing the Palmer Tyre, Ltd., in the lead where aero wheels are concerned, the firm has at once set to work to produce a new wheel, which is now obtainable at relatively moderate cost. The new Palmer wheel measures 375 by 55 mm., and has been given the name "Bijouplane" wheel, a name which, the makers suggest, is no worse than some of the other names that have been suggested for describing low-power aeroplanes. The "Bijouplane" wheel has a hub measuring $4\frac{3}{4}$ ins. in length by 1 in. bore, and the weight of each wheel, complete with tyre and shields, is 5 lbs., which should be light enough to satisfy anybody.

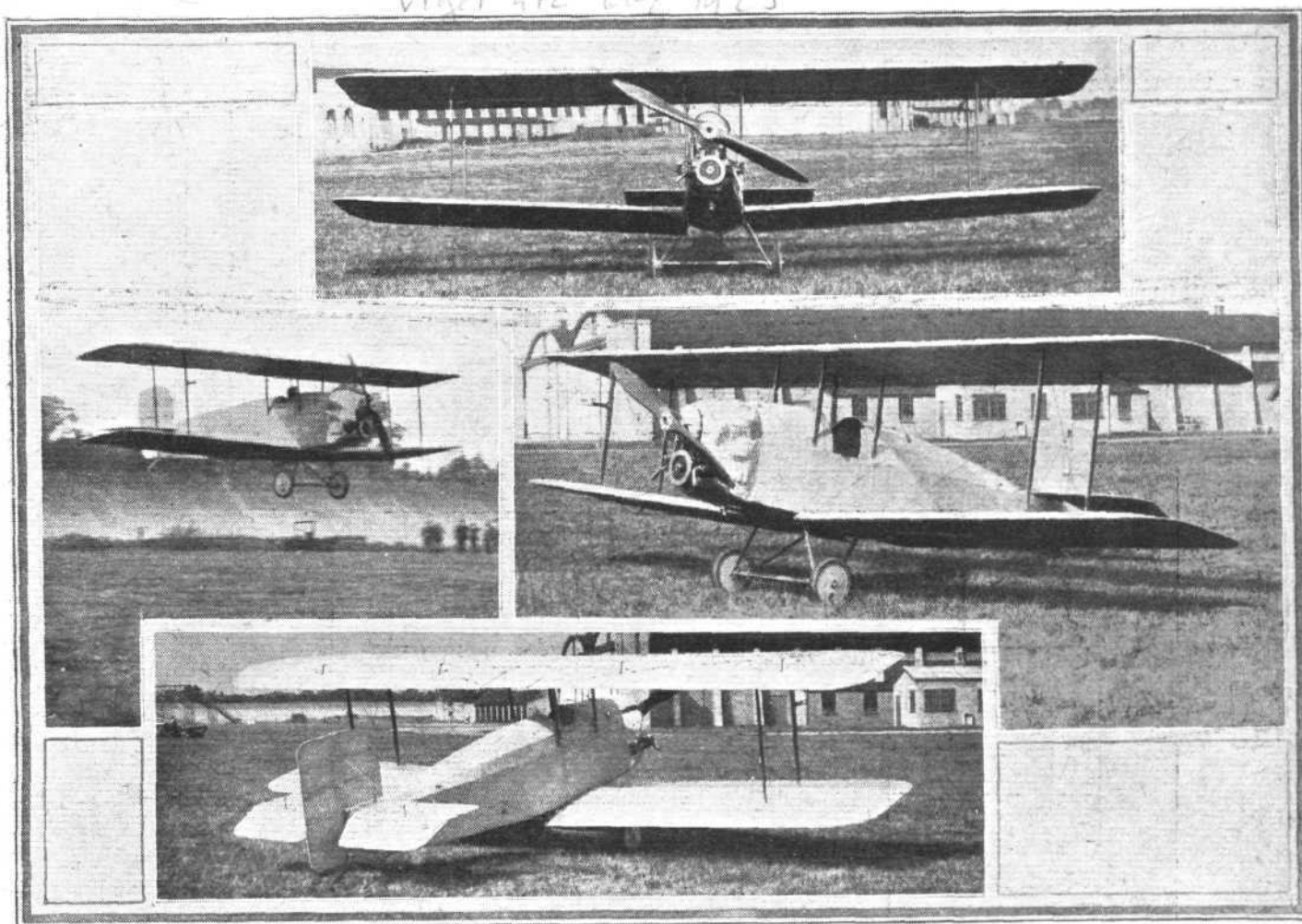
THE VICKERS "VIGET" LIGHT 'PLANE

750 c.c. Douglas Engine

AN exceptionally fine piece of work. This is the main impression left upon one's memory after a thorough inspection of the new Vickers light 'plane, designed and built for the forthcoming competitions at Lympne in October. The machine is in no way original, and for that matter might equally well have been built in 1913. The "Viget," as the type has been christened, is in fact a perfectly normal equal-span, non-staggered biplane, with Rafwire bracing and one pair of interplane struts. The construction throughout is of the normal wire-braced form used in larger machines, and aerodynamically the "Viget" is equally orthodox. This fact should not, however, be used as a criticism of the design. While there are those who believe that the monoplane offers the only solution of really low-power flight, there are others who maintain that this has not yet been proved, and that there is at least a possibility that the braced biplane, with its

over any other type. Personally we are inclined to think that there is so little to choose between the monoplane and the biplane that in the future there will be room for both.

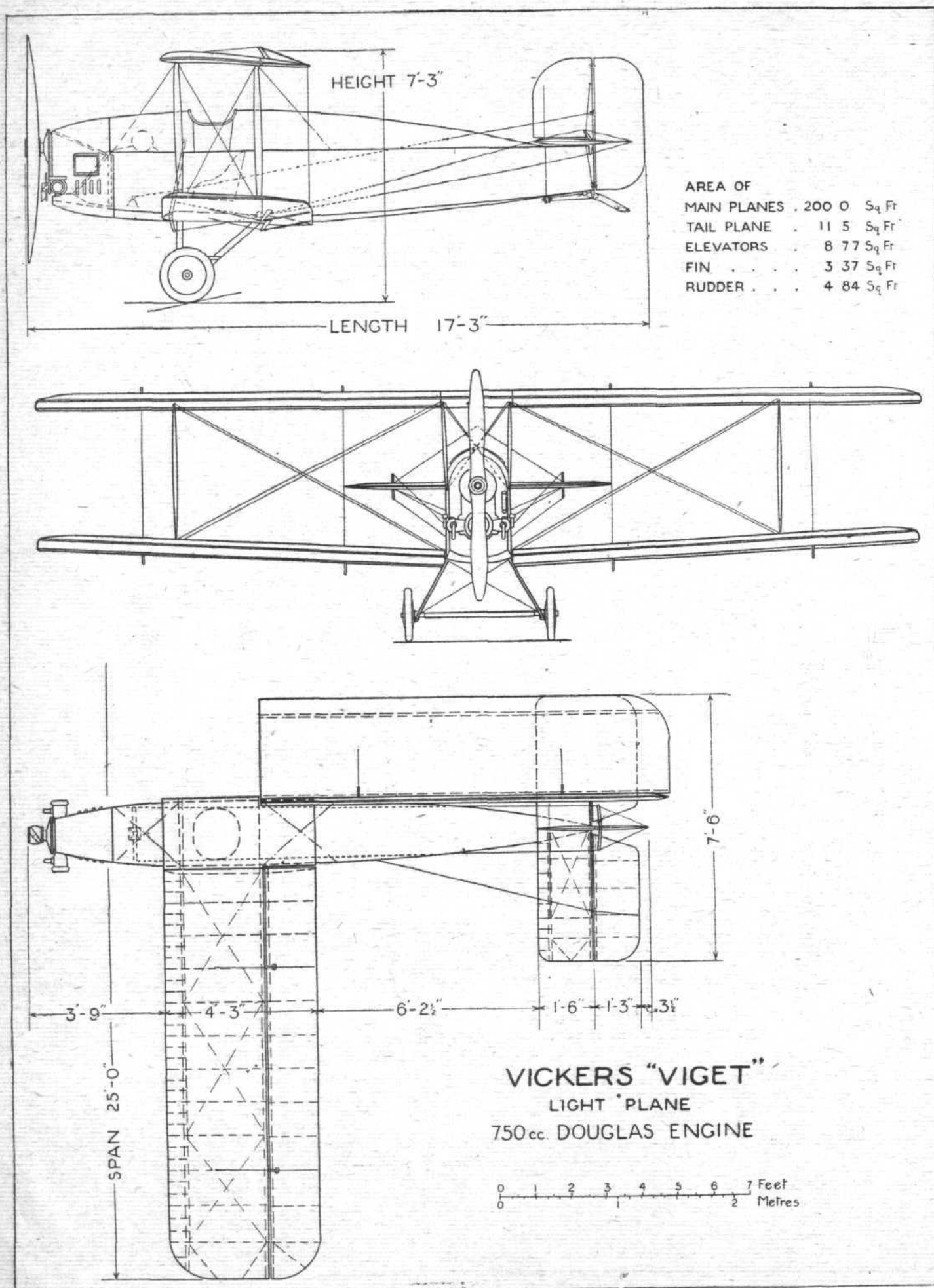
The Vickers "Viget," then, is a perfectly orthodox biplane, using normal bracing and having R.A.F. 15 wing section. The machine is well illustrated in the accompanying photographs, general arrangement drawings and perspective sketches. What is more difficult to show, however, is the excellent workmanship and careful detail design put into the machine, and in this respect the "Viget" might have been built for an aero show, the work being well up to any show finish usually found on larger aircraft. It appears that Vickers have, in building this machine, worked on the old assumption that what is worth doing at all is worth doing well. Certainly both workmanship and finish are as good as on the larger aircraft carrying the Vickers name.



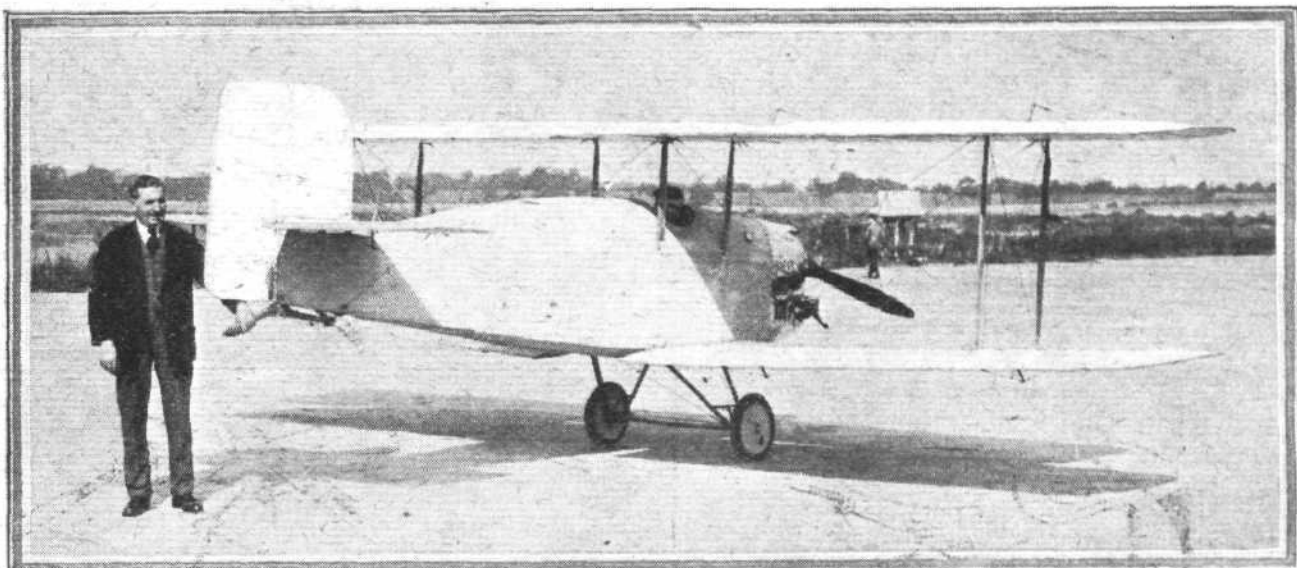
THE VICKERS "VIGET" : Front, three-quarter front, and three-quarter rear views. On the left the machine is coming in after her first flight, piloted by Capt. Cockerell.

lighter construction and smaller overall size, offers certain advantages which may outweigh any small aerodynamic advantages which the cantilever monoplane possesses. Mr. Rex Pierson, Vickers' chief designer, has gone into the question very thoroughly, and the fact that he has decided in favour of the biplane appears to prove that he has come to the conclusion that, by the time all the factors have been taken into consideration, the biplane offers the better solution. For several reasons we are pleased that Mr. Pierson should have come to this decision. If we are to learn anything from the competitions (and we are not very hopeful in this respect) it is essential that as many different types as possible should be represented, so that they can be compared and their performances and behaviour noted. Especially when, as in this case, the engine of the biplane is the same as that used on some of the monoplanes is comparison facilitated, and there is thus more likelihood of finding out definitely whether in fact any one type does possess any very pronounced advantage

The fuselage of the "Viget" is a wire-braced girder structure with spruce longerons and struts. The longerons are of plain square section, while the struts have been spindled out to a cruciform section. The fuselage fittings are of a novel type, and appear especially suitable for light 'planes, where the longerons are of such small size as to render piercing out of the question. The fittings on the "Viget" are of Vickers Duralumin, and are so designed as to wrap around the longerons, small woodscrews being used for locating the fittings on the longerons. The fittings are formed of two separate units, one for the vertical and one for the horizontal bracing. The horizontal portion is slipped into a cut-out in the vertical component, as indicated in one of our sketches, so that it becomes necessary to slide the fittings on to the longerons. It might be objected that it is thus impossible to replace a damaged fitting without dismantling the fuselage. While this is admittedly so, it is possible to meet the criticism by pointing out that a fitting should not need renewal, and



THE VICKERS "VIGET" LIGHT PLANE: General arrangement drawings, to scale.



THE VICKERS "VIGET" LIGHT PLANE: This photograph gives a good idea of the ease with which this machine can be wheeled along by one man. For transport over longer distances the wings are folded.

that if the fuselage is accidentally damaged the longerons are likely to need replacing, in which case dismantling would be necessary anyway.

In section the fuselage is rectangular as regards its main structure, but a shallow fairing has been added to the bottom and a much deeper one to the top, which latter serves to streamline the pilot's head and shoulders. The sides of the fuselage are flat.

The pilot's cockpit is under the trailing edge of the top plane, as the machine is a vertical biplane, and in order to facilitate entrance a small door is provided on the port side. As the main structure of the fuselage is not very deep, while the deck fairing is of considerable height, this door enables the pilot to step into the cockpit without great difficulty. The controls are of usual type, the joy-stick being a Duralumin tube mounted on a universal joint. A complete set of instruments is carried, comprising air-speed indicator, revs. indicator, altimeter and inclinometer.

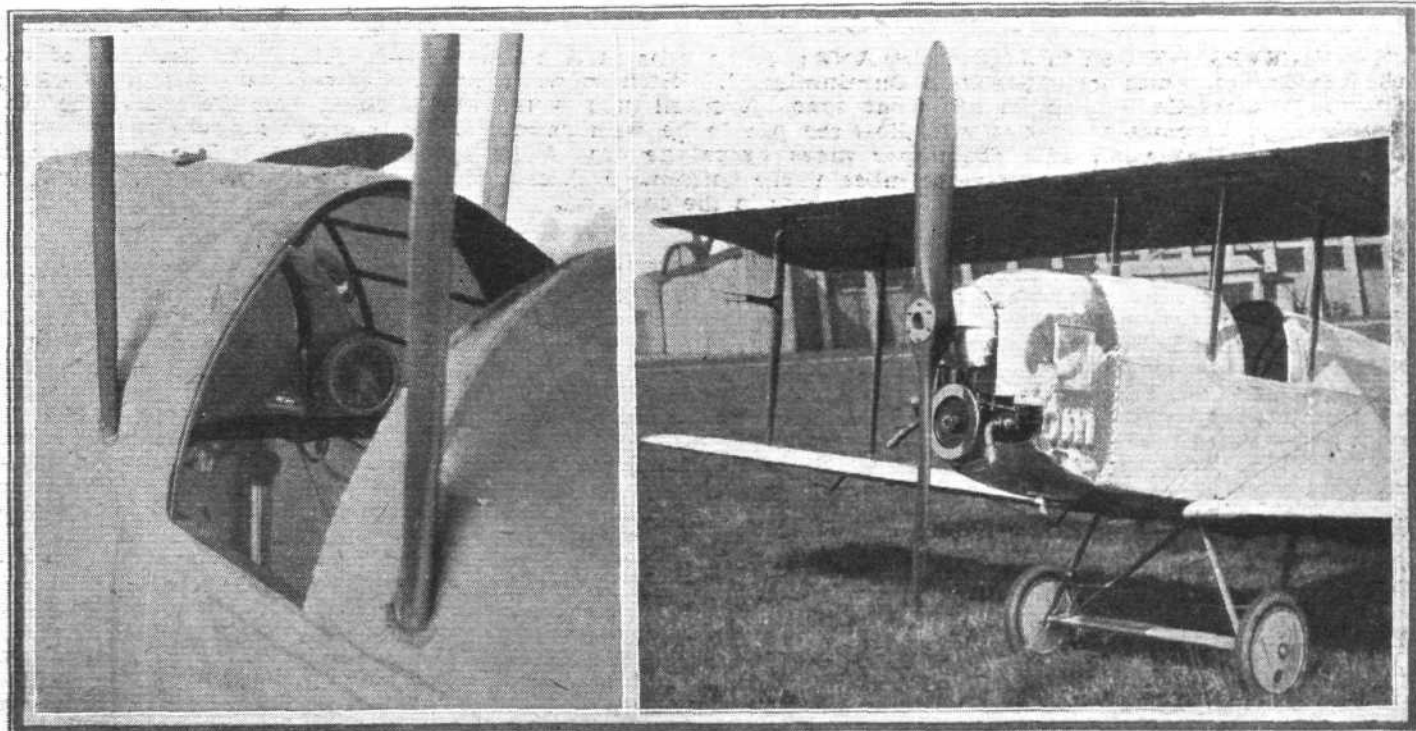
The 750 c.c. Douglas flat twin air-cooled engine is mounted in the nose of the fuselage, and is neatly cowled in. Immediately aft of the engine housing is a fireproof bulkhead, and from this the lower longerons are extended forward in the shape of two steel tubes. The top longerons of this portion are also

tubes, but slope down at a sharp angle to meet the lower longerons. The forward ends of the steel tube structure thus formed are joined by cross tubes carrying the engine. Contained in an aluminium casing, whose feet rest on the top of the engine crank-case, is a large sprocket carried on the propeller shaft, which latter rests in bearings in the casing and is provided with a ball thrust bearing. The drive is by chain, and the size of sprockets is such as to give a reduction gearing of $2\frac{1}{2}$ to 1. The casing containing the propeller shaft and sprocket is braced at the top in a fore and aft direction by tubes from the engine bulkhead.

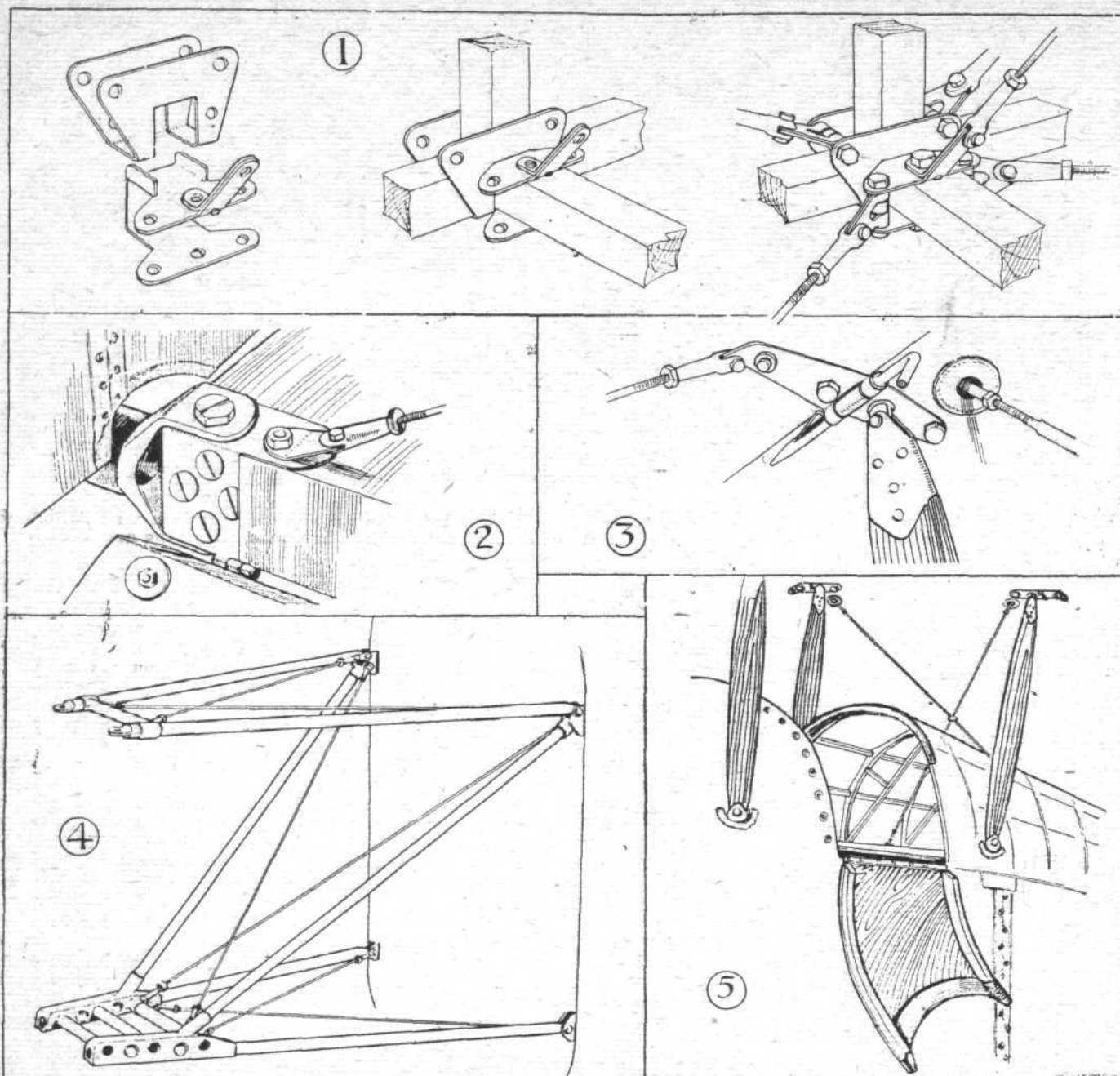
As the propeller shaft is mounted above the engine, the latter is placed sufficiently low to allow of direct gravity feed from the tank mounted in the deck fairing behind the engine bulkhead. Thus no petrol pumps are necessary, and the whole petrol system is simplified.

The undercarriage is of normal V-type, built up of streamline steel tubes, and rubber cord shock absorbers are used.

Constructionally the wings are of standard type, of wood construction and fabric covered. The wing section used is the R.A.F. 15, and the biplane structure is only unusual in that the ailerons are of very large area and run right across. The top ailerons are hinged to the top corner of the upper rear wing



THE VICKERS "VIGET": On the left, a view into the cockpit, and, on the right, the mounting of the Douglas engine. Note the chain reduction gear.



THE VICKERS "VIGET" LIGHT PLANE: Some constructional details—1. Analytical sketches of the fuselage fittings, which are made from Duralumin. 2. Sketch showing hinge on lower rear spar. 3. Locking pin with "umbrella" catch on top front spar. A small tube is used for slipping over the end of the pin, compressing the catch so that it will allow the pin to be withdrawn. 4. Diagrammatic perspective view of the tubular engine mounting. The upper tubes brace the top of the sprocket casing, while the engine is supported on the two front transverse tubes at the bottom. 5. Access to the pilot's cockpit is facilitated by a door in the coaming.

spar, while the lower ailerons are hinged at the bottom corner. Inter-plane aileron wires connect upper and lower ailerons, and when these have been cast adrift the top ailerons can be folded upwards and the lower ailerons downwards. The wings are hinged at the rear spar, and when folded back, with the aileron flaps up and down respectively, lie back with their rear spars against the sides of the fuselage. Thus the folded width comes within that stipulated for the transport test of the competitions at Lympne (7 ft. 6 ins.). When the wings are folded one man can quite easily wheel the machine along a level road, although a steep hill might prove somewhat beyond the strength of the average pilot. The bottom rear spar is hinged to the forked ends of a tube running across the bottom of the fuselage, and the L-bolts in the front spar, by means of which the wings are locked in position when spread, are fitted with catches similar to those commonly found on umbrellas. A small tool in the form of a short tube is slipped over the end of the bolt and over the wire catch, depressing the latter so as to allow the bolt to be withdrawn. This forms the subject of one of our sketches.

The tail of the Vickers "Viget" is of standard type, externally braced by streamline wires. Provision is made for adjustment of the tail plane while the machine is on the ground.

This adjustment is of very simple type but provides for quite a wide range of angles. The stern post of the fuselage is in the form of a steel tube. Around this tube is wrapped a piece of sheet steel open at the side facing the rear spar of the tail plane. In the edges, which are shaped to the radius of the rear spar around the front spar as centre, a series of holes are drilled corresponding with holes in a steel fitting on the rear spar of the tail plane. The holes in the two members of the fitting are so staggered in relation to each other that a movement up or down corresponding to but a fraction of the diameter of the holes brings two sets of holes opposite one another. Thus a very fine adjustment is possible.

Our general arrangement drawings show the main dimensions of the Vickers "Viget." Suffice it to add that the estimated total loaded weight was 625 lbs., but that the machine has come out somewhat lighter than that figure, so that with a pilot of 168 lbs. and 1 gallon of petrol and $\frac{1}{2}$ gallon of oil the machine will probably weigh slightly under 600 lbs., giving a wing loading of just under 3 lbs./sq. ft. If we assume that the Douglas engine will develop about 20 h.p. at the speed at which it will be run for normal flying (as distinct from the conditions in the "economy" competition) the power loading becomes approximately 30 lbs./h.p.

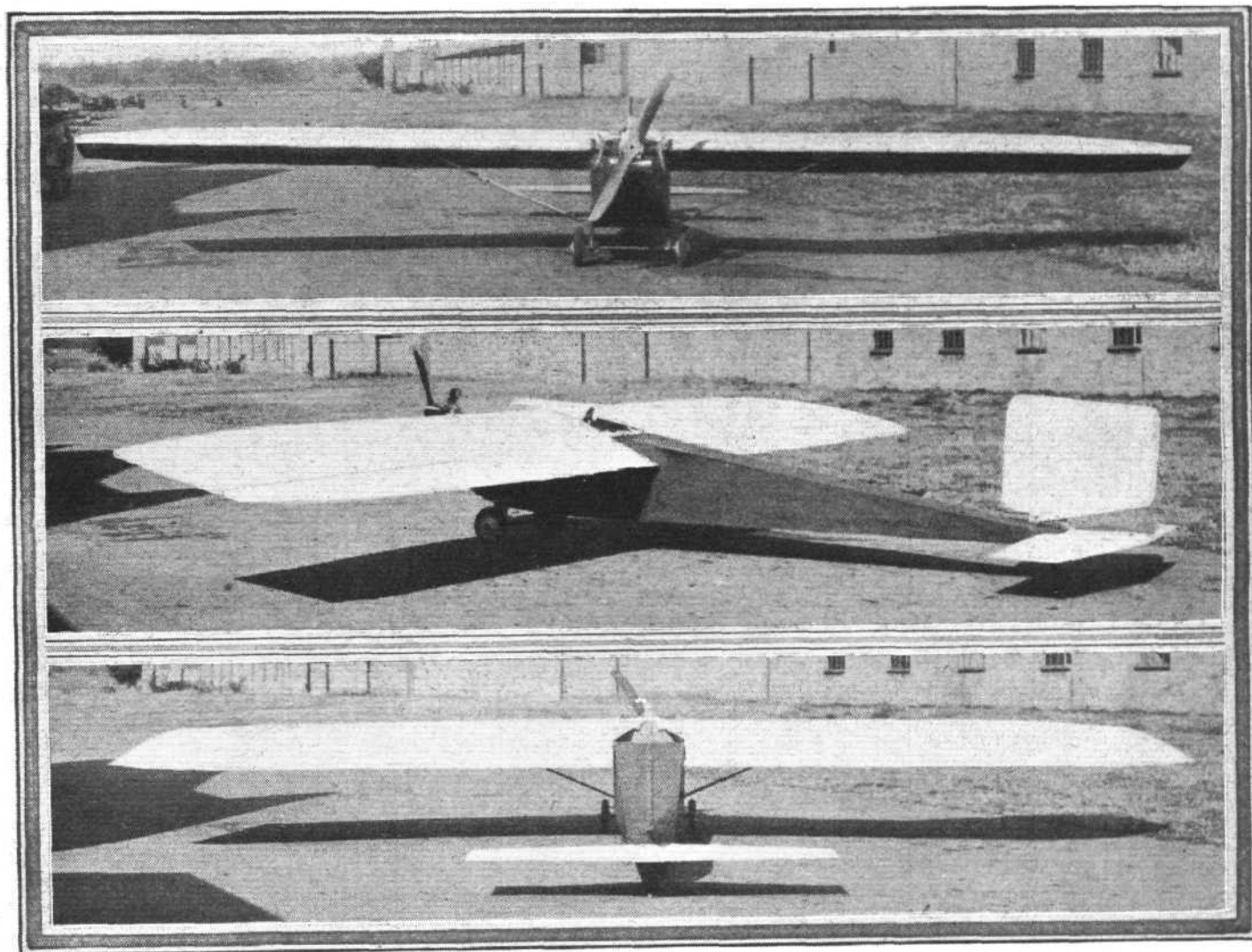
THE HANDASYDE LIGHT 'PLANE

750 c.c. Douglas Engine

LAST week we published the first photograph of Raynham's light 'plane, designed by Mr. Handasyde and built by the Air Navigation and Engineering Company, Ltd., of Addlestone. This machine, designed for the competitions for the Sutherland, *Daily Mail*, and other prizes, is a straightforward miniature monoplane, with the wing resting on top of the fuselage and the pilot placed in a cut-out portion of the trailing edge. Thus the machine is not of the "glider" type, in which both pilot and engine are placed ahead of the wing, as in the "Wren," designed by Mr. Manning and built by the English Electric Company of Preston.

Although the outline design differs from that of the glider

sketch. The wing construction is similar to that of last year's Handasyde glider, the large spar being a ply-wood covered box, which gives very great rigidity and is especially good in resisting torsion. The wing is not, however, a pure cantilever, but is externally braced by a tube to the front spar and a wire to the rear spar. As the wing section used is one of the Göttingen series, in which the centre of pressure is very far back, this form of bracing is probably quite satisfactory. Another advantage of this section is that with the c.p. well back the pilot's cockpit need not be very far forward in the section to trim the machine. Thus in the Handasyde light 'plane the machine trims with the cockpit placed just aft of



THREE VIEWS OF RAYNHAM'S LIGHT 'PLANE, WITH 750 c.c. DOUGLAS ENGINE: This machine is a miniature monoplane of semi-cantilever type. The wing is braced on each side by one strut and one wire. The Douglas engine drives the tractor screw direct. The wing and tail are painted yellow (Raynham's racing colour) and the fuselage dark grey.

used by Raynham at Itford last year, the construction is in the main the same, with a few modifications here and there. The fuselage is of rectangular section, terminating at the stern in a horizontal knife-edge. It is entirely ply-wood covered, whereas the wing and tail are covered with fabric.

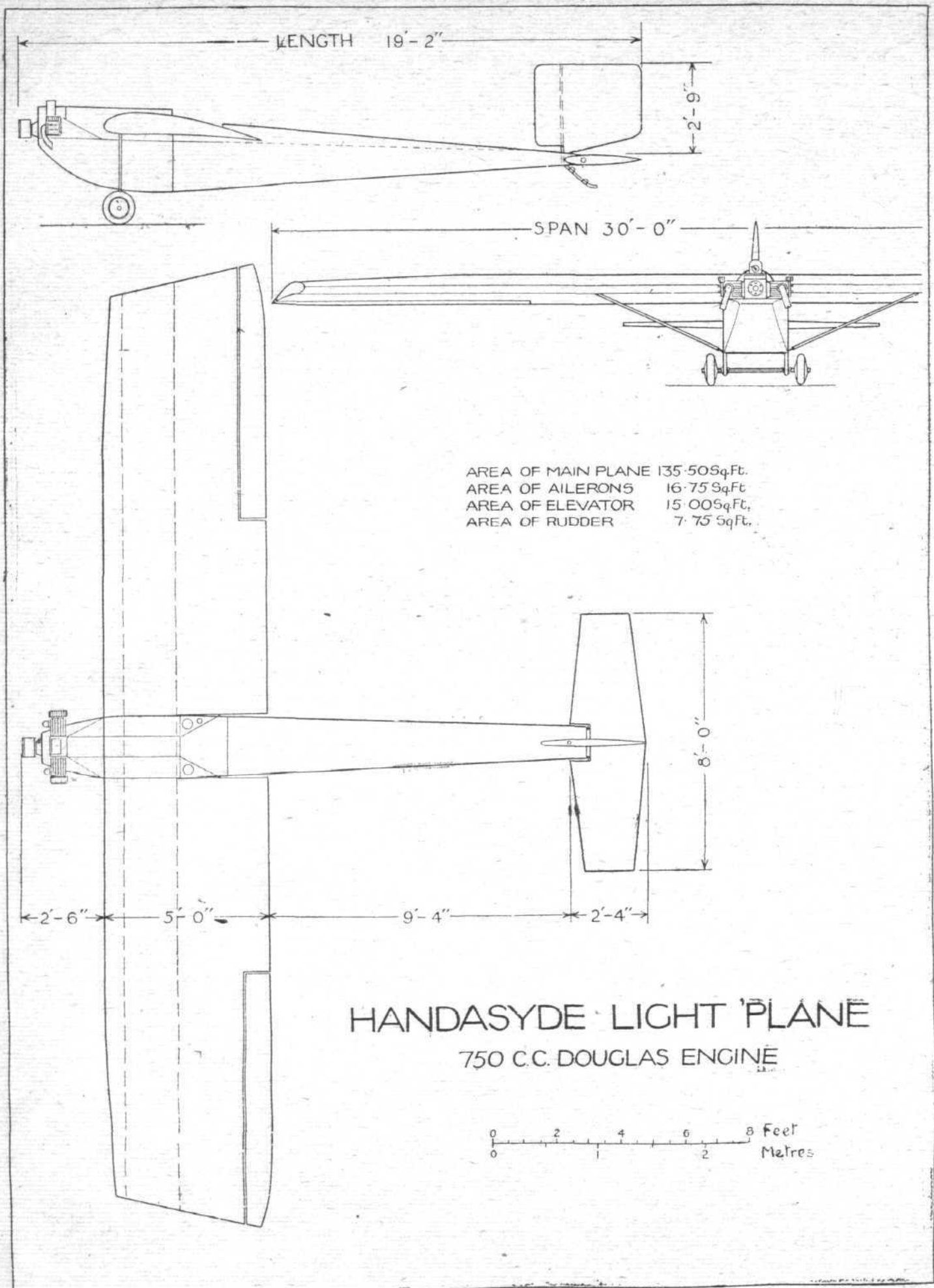
The 750 c.c. Douglas flat-twin air-cooled engine is mounted on a very simple engine plate in the nose of the machine, and the petrol and oil tank is supported aft of the engine on two transverse beams running across the fuselage. As the engine is mounted fairly high, and the tank is but little above it, there is not sufficient head to enable direct gravity feed to be used. However, for the small sizes and capacities involved there is probably no objection to a pressure petrol feed. The engine can be very quickly removed from the fuselage, and is very accessible, mounted as it is on the top of the forward end of the longerons. The drive is direct, and no flywheel is fitted, the propeller being of sufficient weight to take its place.

The wing is built in one piece, and is attached to the top longerons by simple steel fittings of the type indicated in a

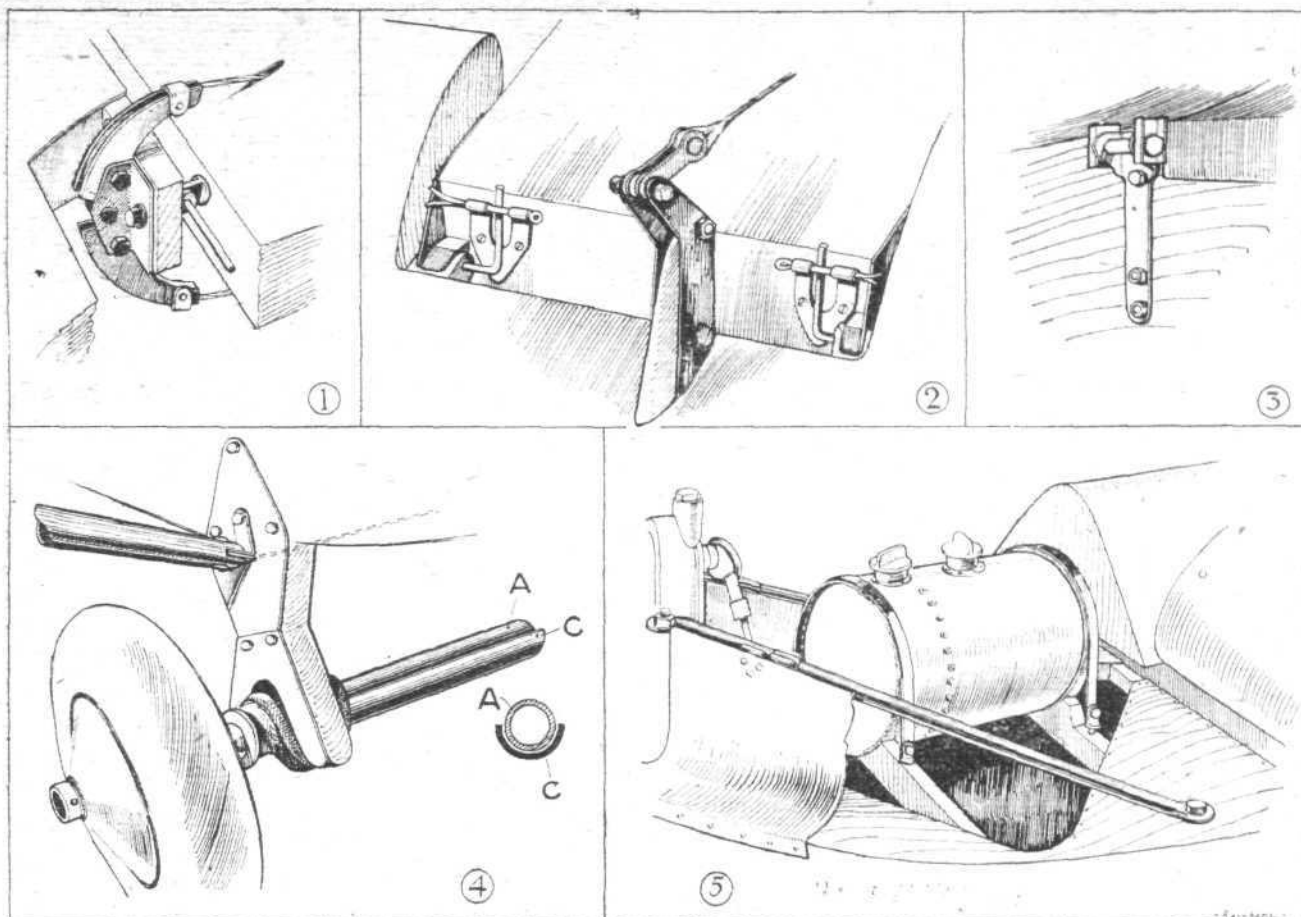
the spar, so that only the trailing edge need be cut away. A narrow fairing runs from just aft of the engine to the pilot's cockpit, and contains in its forward portion the fuel tank. This fairing is only about a foot wide, and thus enables the pilot to look past it.

From the cockpit a very good view is obtained when flying, and especially when coming in to land, with the tail well up, but for climbing it would seem that the wing must obstruct the view considerably, although in this respect the machine is probably no worse than the pre-War monoplanes in which the pilots sat between the wing spars. The dials of the various instruments are fitted flush with the deck of the fuselage, where they can be easily seen and are in full daylight. The controls are of usual type, and call for no comment.

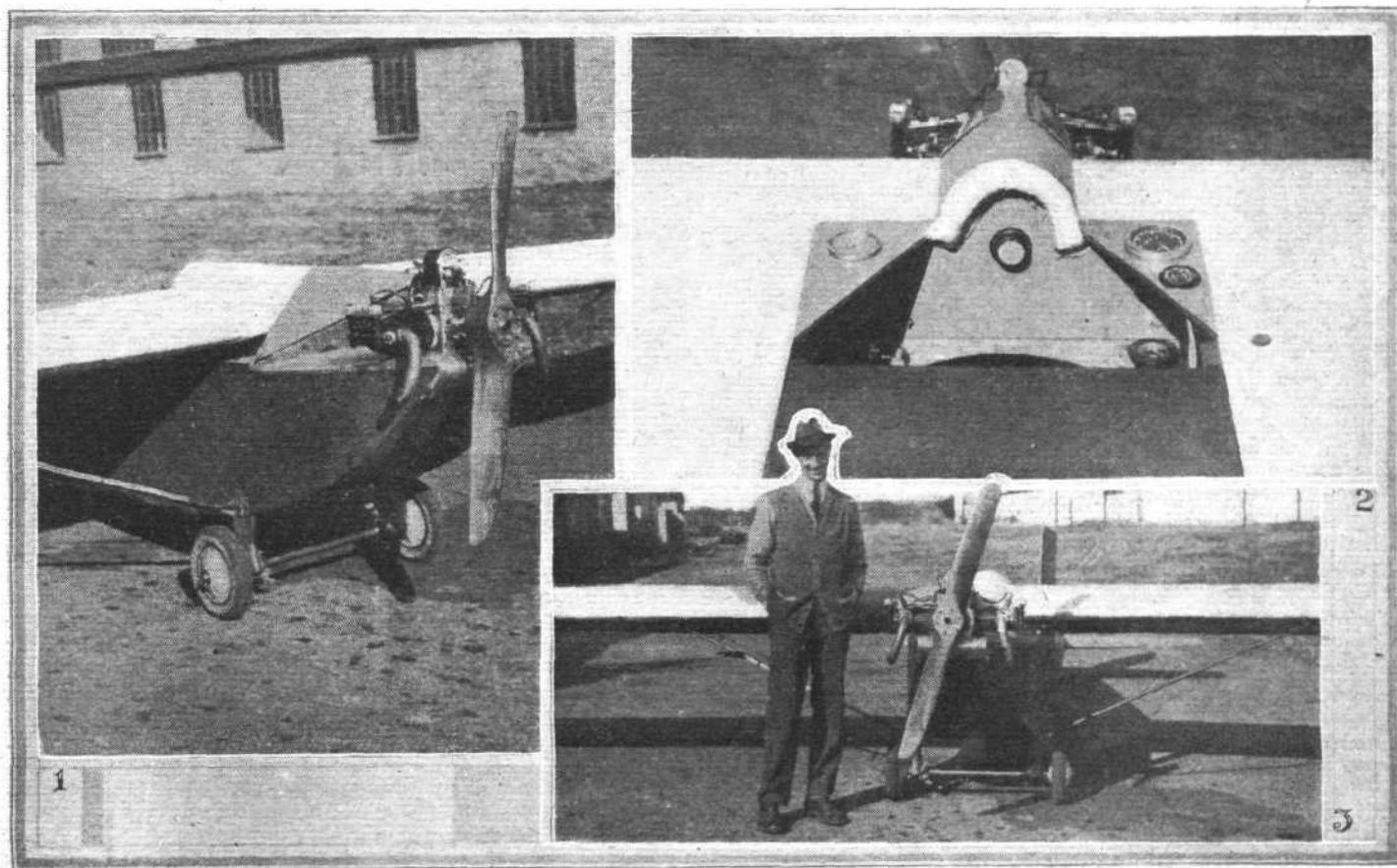
There is neither fixed tail plane nor vertical fin on the Handasyde light 'plane, the rudder as well as the elevator being cantilevers, and of fairly thick section. The rudder is balanced by a fairly large area being ahead of the pivot, and the elevator also is balanced by the leading edge being ahead of the hinge line. The elevator is tapered in chord and



THE HANDASYDE LIGHT 'PLANE: General arrangement drawings to scale.



RAYNHAM'S HANDASYDE LIGHT 'PLANE: Some constructional details. 1. Aileron hinge and crank. 2. Split pin locking device for elevator hinge pins, and elevator crank. 3. Attachment of wing to fuselage. 4. Details of the very simple undercarriage. 5. Mounting of the petrol and oil tank.



THE HANDASYDE LIGHT 'PLANE: On the left, a view of the nose, showing the Douglas engine and the small-diameter direct-driven airscrew. The undercarriage is of very simple form, two short cantilever struts carrying the axle and rubber shock absorbers. On the right is shown, above, the pilot's cockpit, with the various instruments. Below, Raynham is seen standing by his machine. This photograph gives a good idea of the small overall height of the machine.

thickness from centre to tip, but it is of interest to note that in the case of the main plane the taper does not begin until a considerable distance out from the centre. This results in deep spars over the whole of the inner portion of the wing, and gives greater torsional strength than would a wing which began to taper immediately from the fuselage.

The undercarriage is of the simplest possible type, as shown in one of our sketches. The axle rests in slots in two short

wood struts, which, in view of their short length, are strong enough to take the loads without having to be braced either fore and aft or laterally. In other words, they are short cantilevers, and are joined together by a transverse member in the form of a half-tube in which the axle rests. Raynham has had the machine painted in his racing colours, i.e., the wings and tail are bright yellow and the fuselage dark grey, making quite a distinctive combination.

THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

THE SCHNEIDER INTERNATIONAL SEAPLANE RACE

The Schneider International Seaplane Race will be held at Cowes, Isle of Wight, on Friday, September 28, 1923, starting at 11 a.m.

The following countries are competing:—

France	Three competitors.
America	Three competitors.
Italy	Two competitors.
Great Britain	Two competitors.

The circuit is Cowes, Selsey, Southsea, and will be covered five times, making a total distance of 186 nautical miles.

Competitors representing each country will be started together, and the interval between the start of each country will be 15 minutes.

Arrangements for Members

Cowes.—The Committee of the Royal Yacht Squadron, Cowes, have kindly loaned the Platform and Battlements of the Squadron to the Club on the occasion of the Race. From this position members will obtain an excellent view of the race.

Members and Associates will be admitted to the Squadron Platform on production of their Membership Badges.

Southsea.—The turning point at Southsea is the South

Parade Pier, and the competitors will pass along the front of Southsea.

Selsey.—The turning point is in close proximity to the Windmill.

Hotels at Cowes.—The Gloster, Fountain, Royal Marine, and Medina are filling up, and members are recommended to stay the night at Southampton and take the early boat for Cowes, which arrives in good time for the start.

MOTOR-GLIDER COMPETITIONS

October 8-13, 1923

The Motor-Glider Competitions will be held at Lympne Aerodrome, near Hythe, commencing on Monday, October 8, 1923.

Members and Associates will be admitted free to the Aerodrome on presentation of their Membership Badges. Motor-cars, 2s.

Arrangements have been made for luncheons and teas to be served on the Aerodrome.

The Club's Headquarters during the week will be at the Imperial Hotel, Hythe. Special terms to Members of the Club, 17s. 6d. per day, exclusive of luncheon.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

LONDON TERMINAL AERODROME

Monday evening, September 17, 1923

THE regrettable accident to the London-Manchester "air express," in which five lives were lost, overshadows all other news this week. A feeling of gloom pervades the aerodrome as a result of the crash, particularly so as one of the most popular pilots on the service, Capt. L. G. Robinson, M.C., was one of the victims. Capt. Robinson, who was chief pilot of the Daimler Airway, was accompanied by Mr. G. E. Pratt—who was making his first flight to Manchester—in order to show him the route, and at the time of the accident Mr. Pratt was actually piloting the machine. It is almost impossible at the present time to form any clear idea of the cause of the accident, but expert opinion at the aerodrome believes that it was primarily due to an oncoming storm and the thick ground mist. The pilot evidently decided to land, and while doing so a row of trees loomed up through the mist, and it was in an attempt to avoid these that the accident occurred.

Very little is known of Mr. Pratt at the aerodrome, as he had only recently left the R.A.F. and joined the Daimler Airway, but Capt. Robinson had been with the Company since its inception, and had carried in Daimler D.H.34's nearly one thousand passengers. The machine itself was the famous G-E.B.S., which had up to the time of the accident flown over 150,000 miles without mishap. It is interesting to note that the Daimler Airway, up to date, have flown nearly half a million miles and carried five thousand passengers without any previous fatal accident to a passenger. One of the most favourable points with regard to the accident, if such calamity can be said to have a favourable point, is that the passenger bookings have been very little affected by it, and this morning a full complement of passengers for Berlin left as usual.

Success of the Zurich Service

THE Handley Page Service to Zurich has proved a great success, and the 0.400 which flies between Paris and Zurich, connecting with the London-Paris service, is practically fully-laden on every journey.

There is every sign that the seasonal drop in passengers is commencing, but the decline is very gradual as yet, and Handley Page's three machines are still busily employed transporting passengers and goods to and from Paris.

The Prague extension of the Instone Line is still unstarted, but between London and Cologne the traffic continues to be universally good, and on several occasions the Instone "Vickers' Vulcan" has been put on the service to help to cope with the large quantities of goods which are consigned between London and Cologne. Lieut.-Col. Henderson, too, is

having a busy time on the Surrey Flying Services D.H.9, making trips between London, Brussels, and Cologne, and it is quite the usual thing for him to make the return trip between London and Cologne in a single day. In fact, it was rumoured that during the week he made a return trip to Brussels, and then a return trip to Cologne, all in the same day.

One of the German aeroplanes bringing a cargo of paper marks for trans-shipment to Cologne made a forced landing in Belgium during the week, and its cargo and personnel were confiscated by the Belgian authorities, and the machine itself will, one supposes, be added to the other Belgian trophies of the late War.

Khaki-clad surveyors from Southampton have been busy recently measuring up the aerodrome, and one meets them at every turn, with their chains, rods, poles and perches, plotting out the roads and buildings. Both the present aerodrome and the proposed extension on the Beddington side of Plough Lane have been measured up.

The £1,000,000 National Company

LITTLE news is forthcoming as to the developments with regard to the £1,000,000 monopoly company. In fact, as far as can be ascertained, the position seems to be one of stalemate. Neither side, if it is permissible to call them sides, are as optimistic as hitherto, and in fact, as far as the aerodrome is concerned, interest in the result seems to have evaporated purely from lack of news, and the subject, although it vitally concerns everyone employed on the aerodrome, appears to be causing little comment.

The Surrey Flying Services were again favoured with good weather for joy-riding over the week, but whether as the immediate result of the accident to the Manchester "air express" or not, there were comparatively few joy-riders, although the crowds at the aerodrome were, if anything, greater than ever.

Today sees the start of the winter services on the air lines, caused by the advent of winter time, and several alterations have been made in the time-tables. On the London routes, such as the Daimler Airway's London-Berlin service, there is still some doubt as to whether this will be flown in the course of a single day during the winter, but it is hoped that by shortening the route this may be accomplished. I understand also that the state of the aerodromes in Northern Germany is causing some anxiety, as, owing to the flat nature of the ground on this route, the aerodromes are liable to become sodden in winter, and not at all inviting landing places for heavily-laden commercial machines.

THE ROYAL AIR FORCE

London Gazette, September 7, 1923

General Duties Branch

Col. (temp. Maj.-Gen.) Sir I. L. B. Vesey, K.B.E., C.B., C.M.G., D.S.O., is granted a temp. commn. as an Air Vice-Marshal on being seconded for two years' duty with R.A.F., and is apptd. Director of Organisation and Staff Duties, Air Ministry; Aug. 1.

London Gazette, September 11, 1923

General Duties Branch

Squadron Leader L. L. Maclean is appointed Provost Marshal and Chief of Air Force Police; Sept. 1. Flight-Lieut. F. E. Bishop is appointed Assistant Provost Marshal and Deputy Chief of Air Force Police; Sept. 1.

The following are granted short service commns. as Flying Officers, with effect from, and with seniority of, the dates indicated:—R. Duncanson; Aug. 31. D. P. Hadow, M.C.; Aug. 29; L. F. Wilson; Aug. 30.

The following Flying Offrs. of the Supplementary List are promoted to rank of Flight-Lieut. (June 1):—C. H. Goring, D.S.O., M.C., R. M. Taylor, M.C. Air Commodore C. L. Lambe, C.B., C.M.G., D.S.O., is placed on half-pay, Scale A; Sept. 4.

The following are transferred to the Reserve (Sept. 12):—

Class A

Flight-Lieut.—F. Hudson, M.C.

Class B

Flight-Lieut.—J. H. Jennings.

Flying Officer.—A. H. Barnard.

Class C

Flying Officer.—Dr. R. L. Powell.

Observer Offr. R. Nicholson is placed on retd. list; Sept. 15. Flying Offr. F. A. Giles resigns his perm. commn.; Sept. 12. Flying Offr. H. R. Sayers resigns his short service commn., and is granted rank of Capt.; Aug. 28.

Stores Branch

Flying Offr. H. C. F. Ellis is granted a short service commn. for accountant duties, for four years on active list, in rank stated; July 24. His name will be placed on the gradation list immediately following that of Flying Offr. E. K. Greenhow, M.C. Flying Offr. H. J. Young, M.B.E., is transferred from Gen. Duties Branch to Stores Branch; April 30. His name will be placed at the bottom of the gradation list of Flying Offrs. Flight-Lieut. H. S. Alger is transferred to Res., Class B; Sept. 12.

Medical Branch

Flight-Lieut. H. L. Burton, M.B., is granted a perm. commn. in the rank stated; Sept. 12.

Chaplains' Branch

The Rev. A. W. Brown is granted a short service commn. as a Chaplain, with the relative rank of Squadron Leader; Sept. 2. The Rev. J. Black, O.B.E., M.A., resigns his hon. commn. as a Chaplain; Sept. 1.

Reserve of Air Force officers

Class A

The following are granted commns. on probation in the ranks stated in the General Duties Branch (Sept. 11):—

Flying Officers.—H. J. Andrews, F. M. L. Barr, G. T. Legge, K. E. Shelley, F. G. M. Sparks.

Pilot Officers.—G. E. Lavin, F. C. L. Young.

Flying Officer R. Duncanson resigns his commn.; Aug. 31.

London Gazette, September 14, 1923

General Duties Branch

Flying Offr. R. V. Bramwell-Davis (Lieut., R.F.A.) is reseed. for a further two years' duty with the R.A.F.; Aug. 1. Sqdn.-Ldr. R. H. Jones, O.B.E., is restored to full pay from half-pay; Sept. 1.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Vice-Marshal: Sir I. L. B. Vesey, K.B.E., C.B., C.M.G., D.S.O., to Air Ministry. 1.8.23, on appointment to a temporary commission in the Royal Air Force on being seconded from the Army on appointment as Director of Organisation and Staff Duties.

Wing Commander: C. G. S. Gould, to No. 1 Group, Headquarters, Kenley. 1.10.23, for Technical Staff Duties on transfer to Home Establishment.

Squadron Leaders: R. H. Jones, O.B.E., to R.A.F. Depot. 1.9.23, pending embarkation overseas. J. C. M. Lowe, to School of Technical Training (Men), Manston. 10.9.23. G. B. A. Baker, M.C., to No. 1 School of Technical Training (Boys), Halton. 14.9.23. E. W. Norton, D.S.C., to No. 1 Flying Training School, Netheravon. 1.10.23. Sir C. J. Q. Brand, K.B.E., D.S.O., M.C., D.F.C., to No. 56 Squadron, Biggin Hill. 24.9.23. A. F. A. Hooper, O.B.E., and D. E. Stodart, D.S.O., D.F.C., both to School of Photography. 22.9.23, for Course of Instruction in Engineering at R.A.E. C. G. Tucker, to No. 1 Stores Depot, Kidbrooke. 18.9.23.

Flight Lieutenants: J. F. A. Day, A.F.C., to M.T. Repair Depot, Shrewsbury. 14.9.23. E. A. Fawcett, to Inland Area Aircraft Depot, Henlow. 14.9.23. O. C. Bryson, M.C., D.F.C., A.M., to R.A.F. Cadet College, Cranwell. 14.9.23. S. S. Benson, A.F.C., to R.A.F. Base, Calshot. 14.9.23. H. A. Smith, M.C., J. A. Barron, W. Helmore, S. E. Adams, all to School of Photography. 22.9.23, for Course of Instruction in Engineering at R.A.E. W. G. Meggitt, M.C., to School of Photography. 22.9.23, for Course of Instruction in Engineering at R.A.E. on transfer to Home Establishment. J. L. Vachell, M.C., to School of Army Co-operation, Old Sarum. 17.9.23. C. P. O. Bartlett, D.S.C., to Record Office, Ruislip. 19.9.23.

Flying Officers: K. L. Boswell, to Inland Area Aircraft Depot, Henlow. 14.9.23. J. Glover, to Boys' Wing, Cranwell. 14.9.23. J. Harston, to

No. 32 Squadron, Kenley. 11.9.23. H. Hollick-Kenyon, to R.A.F. Depot. 7.9.23, on appointment to a short service commission. A. K. Bamber, to R.A.F. Depot. 10.9.23, on appointment to a short service commission pending disposal. S. E. Storrar, to No. 208 Squadron, Constantinople. 20.8.23. T. A. Warne-Browne, D.S.C., K. A. Meek, M.B.E., W. G. E. Hayman, C. F. le Poer Trench, H. O. Brown, M.M., J. F. Titmas, V. P. Feather, E. D. H. Davies, A. C. Meredith, all to School of Photography. 22.9.23, for Course of Instruction in Engineering at R.A.E. C. H. Harrison, to School of Photography, South Farnborough. 26.8.23, for Course of Instruction in Engineering at R.A.E. E. L. Barrington, M.C., D.F.C., to No. 7 Squadron, Bircham Newton. 17.9.23. D. R. Sharman, M.C., to No. 2 Squadron, South Farnborough. 1.9.23.

Pilot Officers: E. C. Roark, to No. 7 Squadron, Bircham Newton. 4.9.23, for course of instruction. All on appointment to permanent commissions as Pilot Officers from the R.A.F. Staff College, Cranwell.—G. L. Worthington, to R.A.F. Base, Leuchars. 14.8.23. A. D. Davies, F. V. Beamish, both to School of Photography, South Farnborough. 14.8.23. G. R. M. Clifford, H. M. Mellor, both to R.A.F. Base, Gosport. 14.8.23. D. L. Thomson, C. K. J. Coggle, both to No. 39 Squadron, Spittlegate. 14.8.23. R. A. P. Roberts, T. B. Prickman, both to School of Army Co-operation, Old Sarum. 14.8.23. B. D. J. Broadway, K. Scott-Taylor, both to Central Flying Training School, Upavon. 14.8.23. P. Jones, to R.A.F. Base, Calshot. 14.8.23. F. F. W. Hall, to No. 7 Squadron, Bircham Newton. 14.8.23. F. J. Fressanges, N. A. P. Pritchett, both to Armament and Gunnery School, Eastchurch. 14.8.23.

Medical Branch

Squadron Leader (Medical): R. E. Bell, M.B., to Headquarters, Iraq. 8.7.23.

Flight Lieutenant (Medical): W. E. Hodgins, M.B., to No. 5 Squadron, India. 1.8.23.

The Ivinghoe Accident

THE extremely regrettable accident to the Daimler D.H. 34 G-E.B.B.S. on September 14 at Ivinghoe, in Buckinghamshire, which resulted in the death of the two pilots, Mr. G. E. Pratt and Mr. L. G. Robinson, and of three passengers, Mr. J. Grimshaw, Mrs. E. Russel Armitage, and Mr. A. H. Turner, appears to have been the result of stalling while near the ground. The inquest was opened at the Victory Hall, Ivinghoe, on Monday, September 17, when certain evidence was heard, but was adjourned until Monday of next week, September 24. Probably the exact reason will never be definitely ascertained, and we can but express our sincere sympathy with the relatives of the victims of the tragedy.

The Northampton Polytechnic and Aeronautics

IN our notice last week referring to the Evening Classes in Aeronautical Engineering at the Northampton Polytechnic we did not make it clear that there are also Day Classes in this and other subjects. As a matter of fact the Day Classes in Aeronautical Engineering may be considered of far greater importance than the evening ones, as they are constituted on a much larger scale.

Students are trained for four years, and are made, in the true sense of the word, aeronautical engineers. During the four-year course, they spend two summers, from Easter to October, in commercial workshops, and thus become in their specialising years young engineers rather than college students. On the other hand, they are presented, if they be matriculated students of the University, for the degree of B.Sc. (England) at the University of London, and in the past a number of them have obtained that degree, specialising in Aeronautics. For further

details of these courses we refer our readers to a special pamphlet on the subject issued by the Institute, and also to an announcement appearing in our advertisement columns.

Flying at Margate

THE Essex Aviation Company have just finished passenger flying at Palm Bay, Cliftonville, with their Avro (504 K) G-EBCK, piloted by Mr. Frank Neale (late advanced Instructor, R.A.F.). Flying started on August 15, and up to September 10 something like 2,000 passengers have been taken up, at prices ranging from 7s. 6d. to £1. Several passengers were stunted over the sea, for which £1 was charged. The Essex Company left Margate on Tuesday, September 11, and have returned to Epping, Essex.

The French Aircraft Industry Reviewed

OUR French contemporary *L'Air* is to be congratulated on the very interesting special number just published, devoted to French aeronautics. A special edition has been issued printed in English, one of which we have before us, and both the "get up" and the matter contained within its pages are excellent. M. Laurent Eynac, French Under-Secretary of State for Air, writes a short introduction, in which he says: "The present edition of the *Revue L'Air* has no other object than to express what we have accomplished, what we are actually doing and what we intend accomplishing in the future. There are, in the pages of this revue, a series of sound and impartial articles, which, in my opinion, have the double merit of being useful in the eyes of truthfulness as they are in the cause of aeronautics." In addition to the articles referred to there is also a very complete illustrated "guide" to the various French aeroplane, aero engine, and aero component firms.



By Douglas B. Armstrong

"Flown" Covers

A READER enquires the special significance of the term "flown cover," as frequently employed in this column, and also by our advertisers. "Presumably," he writes, "all envelopes, etc., franked with air stamps have been flown." Unfortunately this is not always the case. It is part of the education of the aero philatelist to learn to distinguish between genuinely flown specimens of certain air stamps and those which have been transmitted by ordinary post. For instance, the greater proportion of letters bearing the Alcock-Brown stamp of Newfoundland were forwarded by mail steamer, only 200 letters being actually carried on the famous Trans-Atlantic flight, although 10,000 copies of the overprinted stamp were issued and sold by the post office at St. John's. "Flown" Alcock covers are impressed with the London receiving postmark of June 17, 1919.

When the special air mail stamps of the United States post office were temporarily suspended in July, 1919, the public was allowed to use up the remaining stocks for ordinary letter postage.

Postmarked copies of the first Italian aero stamps are comparatively plentiful, but as only 100 copies each of the journals *La Stampa* and *Il Popolo* were sent by that route those attached to the original wrappers and postmarked "Posta Aerea da Torino a Roma-Maggio 1917" are really scarce.

Again, the triangular air post stamps of Lithuania, which were intended to commemorate the inauguration of the Lithuanian air post service on June 25, 1921, but were not ready in time, had the word "Isteigmas" (inauguration) erased and "Zenklas" (stamp) printed over it, in which form they were valid either for ordinary or aerial postage.

Wanted: A British Air Stamp

In a recent letter to *The Times* on the subject of British air mails a plea for the provision of distinctive postmarks and stamps for air-borne correspondence is voiced by Brigadier-General R. Ridgeway, President of the Aero-Philatelic Club. He writes: "For propaganda work there would appear to be no difficulty for the G.P.O. to institute a special obliteration on all letters, such as was used in Belgium for some time, with the words 'Use air mails,' and to have notices of a similar nature at all post offices, giving correct rates and times of posting to various countries, the institution of new services being notified officially, as soon as possible, in the Press. To popularise the service and to ensure easier facilities an issue of air stamps of the necessary denominations, in ordinary and booklet form, is necessary. Such issues have already been made, and no doubt not without reason, in the United States, Germany, Austria, Switzerland, and other countries. The Air Ministry, with the aid of civil aviation companies, has already produced wonderful results, and it remains for the General Post Office to see that those results are not vitiated by a *laissez-faire* policy which does not allow the public to take advantage of these achievements and to give their enthusiastic support to them."

Rarest Air Stamp

FROM a romantic viewpoint the greatest interest attaches to the Newfoundland stamps that franked letters carried by Hawker and Alcock on their historic transatlantic flights. The rarest of all aero stamps is the 24 cents of the United States series, a single sheet of which was misprinted showing the aeroplane flying upside down. This "stunt" picture is now worth about £150 to its fortunate owner.

Readers are invited to forward to the Editor of *FLIGHT* letters, etc., bearing aerial stamps or postmarks for mention in this column, as well as out-of-the-way varieties, etc.

We shall also be pleased to hear from correspondents interested in air-stamp collecting, and to answer any queries.

IMPORTS AND EXPORTS, 1922-1923

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January, 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; and for 1922 see "FLIGHT" for January 18, 1923.

	Imports		Exports		Re-Exports	
	1922.	1923	1922.	1923.	1922	1923.
Jan. ..	1,152	466	76,552	60,079	23	280
Feb. ..	567	641	69,129	120,236	1,100	3,040
Mar. ..	1,471	589	166,607	71,945	100	689
April ..	3,846	8,508	139,995	167,757	5,880	462
May ..	2,416	845	167,999	55,427	4,254	728
June ..	816	1,433	129,137	141,381	14,530	1,410
July ..	1,039	192	24,405	62,025	—	1,334
Aug. ..	198	2,054	88,910	57,704	685	344
	11,505	14,728	862,734	736,554	26,572	8,287

PUBLICATIONS RECEIVED

Aeronautical Research Committee. Report for the Year 1922-23. London: H.M. Stationery Office, Kingsway, W.C. 2. Price 2s. net.

Aeronautical Research Committee. Reports and Memoranda. No. 832 (M.12).—Report on the Influence of Calcium and of Calcium plus Silicon on Aluminium. By J. D. Grogan, B.A. May, 1922. London: H.M. Stationery Office, Kingsway, W.C. Price 9½d., post free.

Department of Overseas Trade. Report on the Economic and Financial Situation of Egypt, April, 1923. By E. Homan Mulock. London: H.M. Stationery Office, Kingsway, W.C. Price 1s. 7d., post free.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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Published September 20, 1923

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